

CLAIMS

What is claimed is:

- 5 1. A method for dynamic frequency selection in a wireless communication network, the method comprises:

determining, by an access point, interference on a current wireless channel of a plurality of wireless channels,

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when the interference on the current wireless channel exceeds an interference threshold, providing, by the access point, a request packet that requests channel spectrum information to at least one affiliated station via the current wireless channel;

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generating, by the at least one affiliated station, the channel spectrum information of the plurality of wireless channels;

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providing, by the at least one affiliated station, the channel spectrum information to the access point via the current wireless channel;

- 25 interpreting, by the access point, the channel spectrum information to determine a desired wireless channel of the plurality of wireless channels; and

providing, by the access point, a selection packet to the at least one affiliated station via the current wireless channel, wherein the selection packet indicates that the

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access point will change to the desired wireless channel at a future time.

2. The method of claim 1, wherein the determining
5 interference on the current wireless channel by the access point further comprises:

transmitting a holding packet on the current wireless
channel, wherein the holding packet addresses an invalid
10 station; and

measuring the interference on the current wireless channel during a transmit period allocated to the invalid station.

15 3. The method of claim 1, wherein the providing the request packet by the access point further comprises at least one of:

polling the at least one affiliated station;

20 enabling a periodic generation of the channel spectrum information; and

enabling a spontaneous generation of the channel spectrum
25 information.

4. The method of claim 1, wherein the generating the channel spectrum information by the at least one affiliated station further comprises:

30 for at least some of the plurality of wireless channels:

tuning to the each of the at least some of the plurality of wireless channels;

measuring interference on the each of the at least
5 some of the plurality of wireless channels to produce channel interference data; and

compiling the channel interference data of each of the at least some of the plurality of wireless channels to produce
10 the channel spectrum information.

5. The method of claim 1, wherein the interpreting the channel spectrum data by the access point further comprises:

15 computing an outage received signal strength indication level;

comparing the outage received signal strength indication
20 level with a target outage received signal strength indication level; and

determining that another wireless channel of the plurality of wireless channels needs to be selected when the outage
25 received signal strength indication level compares unfavorably with the target outage received signal strength indication level.

6. The method of claim 5 further comprises determining
30 the desired wireless channel by:

selecting another channel within a group of channels of the plurality of channels based on a channel prioritization.

7. The method of claim 1, wherein the interpreting the
5 channel spectrum information by the access point further comprises:

selecting the current wireless channel as the desired
wireless channel when the current wireless channel has a
10 least amount of interference in comparison to other
wireless channels of the plurality of wireless channels.

8. The method of claim 1 further comprises:

15 generating, by the access point, a basic service set
pattern of neighboring access points within the wireless
communication network based on the channel spectrum
information.

20 9. The method of claim 1, wherein the determining that
the interference exceeds the interference threshold by the
access point further comprises:

determining that the interference on the current wireless
25 channel exceeds a first interference threshold;

providing an increase power packet that indicates an
increased transmit power level to the at least one
affiliated station;

30 determining that the interference on the current wireless
channel with the at least one affiliated station

transmitting packets using the increased transmit power level still exceeds the first threshold, and

- when the interference on the current wireless channel with
- 5 the at least one affiliated station transmitting packets using the increased transmit power level still exceeds the first threshold, generating, by the access point, the request packet.

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10. A method for an access point to dynamically select a frequency within a wireless communication network, the method comprises:

5 obtaining channel spectrum information from at least one affiliated station via a current wireless channel of a plurality of wireless channels, wherein the channel spectrum information indicates level interference on at least some of the plurality of wireless channels within the
10 channel spectrum;

interpreting the channel spectrum information to determine a desired wireless channel of the plurality of wireless channels; and

15 providing a packet to the at least one affiliated station via the current wireless channel, wherein the packet indicates that the access point will change to the desired wireless channel at a future time.

20 11. The method of claim 10, wherein the interpreting the channel spectrum data further comprises:

computing an outage received signal strength indication
25 level;

comparing the outage received signal strength indication level with a target outage received signal strength indication level; and

30 determining that another wireless channel of the plurality of wireless channels needs to be selected when the outage

received signal strength indication level compares unfavorably with the target outage received signal strength indication level.

- 5 12. The method of claim 11 further comprises determining the desired wireless channel by:

selecting another channel within a group of channels of the plurality of channels based on a channel prioritization.

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13. The method of claim 10, wherein the interpreting the channel spectrum information further comprises:

selecting the current wireless channel as the desired
15 wireless channel when the current wireless channel has a least amount of interference in comparison to other wireless channels of the plurality of wireless channels.

14. The method of claim 10 further comprises:

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generating a basic service set pattern of neighboring access points within the wireless communication network based on the channel spectrum information.

- 25 15. The method of claim 10, wherein the interpreting the channel spectrum information further comprises:

determining that interference on the current wireless channel exceeds a first interference threshold;

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providing an increase power packet that indicates an increased transmit power level to at least one affiliated station;

- 5 determining that the interference on the current wireless channel with the at least one affiliated station transmitting packets using the increased transmit power level still exceeds the first threshold, and
- 10 when the interference on the current wireless channel with the at least one affiliated station transmitting packets using the increased transmit power level still exceeds the first threshold, generating, by the access point, the request packet.

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16. A wireless communication network that includes a plurality of basic service sets, wherein each of the plurality of basic service sets comprises:

5 an access point (AP); and

a plurality of stations, wherein the access point includes an AP processing module and an AP memory, wherein the AP memory further includes operational instructions that cause
10 the AP processing module to:

determine interference on a current wireless channel of a plurality of wireless channels,

15 when the interference on the current wireless channel exceeds an interference threshold, provide a request packet that requests channel spectrum information to at least one affiliated station of the plurality of stations via the current wireless channel;

20 interpret the channel spectrum information to determine a desired wireless channel of the plurality of wireless channels;

25 provide a selection packet to the at least one affiliated station via the current wireless channel, wherein the selection packet indicates that the access point will change to the desired wireless channel at a future time, and

30

wherein each of the plurality of stations (STA) includes a STA processing module and STA memory, wherein the STA

memory includes operational instructions that cause the STA processing module to:

generate, as the at least one affiliated station, the
5 channel spectrum information of at least some of the plurality of wireless channels;

provide, as the at least one affiliated station, the
channel spectrum information to the access point via
10 the current wireless channel.

17. The wireless communication network of claim 16,
wherein the AP memory further comprises operational
instructions that cause the AP processing module to
15 determine interference on the current wireless channel by:

transmitting a holding packet on the current wireless
channel, wherein the holding packet addresses an invalid
station; and
20

measuring the interference on the current wireless channel
during a transmit period allocated to the invalid station.

18. The wireless communication network of claim 16,
25 wherein the AP memory further comprises operational
instructions that cause the AP processing module to provide
the request packet by at least one of:

polling the at least one affiliated station;

30 enabling a periodic generation of the channel spectrum
information; and

enabling a spontaneous generation of the channel spectrum information.

5 19. The wireless communication network of claim 16,
wherein the STA memory of the at least one affiliated
station further comprises operational instructions that
cause the STA processing module of the at least one
affiliated station to generate the channel spectrum
10 information by:

for the at least some of the plurality of wireless
channels:

15 tuning to each of the at least some of the plurality
of wireless channels;

measuring interference on the each of the at least
some of the plurality of wireless channels to produce
20 channel interference data; and

compiling the channel interference data of the each of the
at least some of the plurality of wireless channels to
produce the channel spectrum information.

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20. The wireless communication network of claim 16,
wherein the AP memory further comprises operational
instructions that cause the AP processing module to
interpret the channel spectrum data by:

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computing an outage received signal strength indication
level;

comparing the outage received signal strength indication level with a target outage received signal strength indication level; and

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determining that another wireless channel of the plurality of wireless channels needs to be selected when the outage received signal strength indication level compares unfavorably with the target outage received signal strength indication level.

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21. The wireless communication network of claim 20, wherein the AP memory further comprises operational instructions that cause the AP processing module to determine the desired wireless channel by:

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selecting another channel within a group of channels of the plurality of channels based on a channel prioritization.

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22. The wireless communication network of claim 16, wherein the AP memory further comprises operational instructions that cause the AP processing module to interpret the channel spectrum information by:

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selecting the current wireless channel as the desired wireless channel when the current wireless channel has a least amount of interference in comparison to other wireless channels of the plurality of wireless channels.

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23. The wireless communication network of claim 16, wherein the AP memory further comprises operational instructions that cause the AP processing module to:

generate a basic service set pattern of neighboring access points within the wireless communication network based on the channel spectrum information.

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24. The wireless communication network of claim 16, wherein the AP memory further comprises operational instructions that cause the AP processing module to determine that the interference exceeds the interference threshold by:

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determining that the interference on the current wireless channel exceeds a first interference threshold;

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providing an increase power packet that indicates an increased transmit power level to the at least one affiliated station;

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determining that the interference on the current wireless channel with the at least one affiliated station transmitting packets using the increased transmit power level still exceeds the first threshold, and

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when the interference on the current wireless channel with the at least one affiliated station transmitting packets using the increased transmit power level still exceeds the first threshold, generating, by the access point, the request packet.

25. An access point for use in a wireless communication network, the access point comprises:

an AP processing module; and

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an AP memory, wherein the AP memory further includes operational instructions that cause the AP processing module to:

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determine interference on a current wireless channel of a plurality of wireless channels,

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when the interference on the current wireless channel exceeds an interference threshold, provide a request packet that requests channel spectrum information to at least one affiliated station of a plurality of stations via the current wireless channel;

20

interpret the channel spectrum information to determine a desired wireless channel of the plurality of wireless channels; and

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provide a selection packet to the at least one affiliated station via the current wireless channel, wherein the selection packet indicates that the access point will change to the desired wireless channel at a future time.

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26. The access point of claim 25, wherein the AP memory further comprises operational instructions that cause the AP processing module to determine interference on the current wireless channel by:

transmitting a holding packet on the current wireless channel, wherein the holding packet addresses an invalid station; and

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measuring the interference on the current wireless channel during a transmit period allocated to the invalid station.

27. The access point of claim 25, wherein the AP memory
10 further comprises operational instructions that cause the AP processing module to provide the request packet by at least one of:

polling the at least one affiliated station;

15

enabling a periodic generation of the channel spectrum information; and

enabling a spontaneous generation of the channel spectrum
20 information.

28. The access point of claim 25, wherein the AP memory
further comprises operational instructions that cause the
AP processing module to interpret the channel spectrum data
25 by:

computing an outage received signal strength indication level;

30 comparing the outage received signal strength indication level with a target outage received signal strength indication level; and

determining that another wireless channel of the plurality of wireless channels needs to be selected when the outage received signal strength indication level compares
5 unfavorably with the target outage received signal strength indication level.

29. The access point of claim 28, wherein the AP memory further comprises operational instructions that cause the
10 AP processing module to determine the desired wireless channel by:

selecting another channel within a group of channels of the plurality of channels based on a channel prioritization.
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30. The access point of claim 25, wherein the AP memory further comprises operational instructions that cause the AP processing module to interpret the channel spectrum information by:
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selecting the current wireless channel as the desired wireless channel when the current wireless channel has a least amount of interference in comparison to other wireless channels of the plurality of wireless channels.
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31. The access point of claim 25, wherein the AP memory further comprises operational instructions that cause the AP processing module to:

30 generate a basic service set pattern of neighboring access points within the wireless communication network based on the channel spectrum information.

32. The access point of claim 25, wherein the AP memory further comprises operational instructions that cause the AP processing module to determine that the interference

5 exceeds the interference threshold by:

determining that the interference on the current wireless channel exceeds a first interference threshold;

10 providing an increase power packet that indicates an increased transmit power level to the at least one affiliated station;

15 determining that the interference on the current wireless channel with the at least one affiliated station transmitting packets using the increased transmit power level still exceeds the first threshold, and

20 when the interference on the current wireless channel with the at least one affiliated station transmitting packets using the increased transmit power level still exceeds the first threshold, generating, by the access point, the request packet.

33. A station for use in a wireless communication network,
the station comprises:

STA processing module; and

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STA memory, wherein the STA memory includes operational
instructions that cause the STA processing module to:

10 generate, as an affiliated station of an access point
of the wireless communication network, the channel
spectrum information of at least some of the plurality
of wireless channels; and

15 provide, as the affiliated station, the channel
spectrum information to the access point via the
current wireless channel.

34. The station of claim 33, wherein the STA memory
further comprises operational instructions that cause the
20 STA processing module to generate the channel spectrum
information by:

for each of at least some of the plurality of wireless
channels:

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tuning to the each of the at least some of the
plurality of wireless channels;

30 measuring interference on the each of the at least
some of the plurality of wireless channels to produce
channel interference data; and

compiling the channel interference data of the at least some of the plurality of wireless channels to produce the channel spectrum information.

the first wireless channel is a first channel and the second wireless channel is a second channel

35. An access point to dynamically select a frequency within a wireless communication network, the access point comprises:

5 AP processing module; and

AP memory that includes operational instructions that cause the AP processing module to:

10 obtain channel spectrum information from at least one affiliated station via a current wireless channel of a plurality of wireless channels, wherein the channel spectrum information indicates level interference on at least some of the plurality of wireless channels
15 within the channel spectrum;

interpret the channel spectrum information to determine a desired wireless channel of the plurality of wireless channels; and

20 provide a packet to the at least one affiliated station via the current wireless channel, wherein the packet indicates that the access point will change to the desired wireless channel at a future time.

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36. The access point of claim 35, wherein the AP memory further comprises operational instructions that cause the AP processing module to interpret the channel spectrum data by:

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computing an outage received signal strength indication level;

comparing the outage received signal strength indication level with a target outage received signal strength indication level; and

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determining that another wireless channel of the plurality of wireless channels needs to be selected when the outage received signal strength indication level compares unfavorably with the target outage received signal strength indication level.

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37. The access point of claim 36, wherein the AP memory further comprises operational instructions that cause the AP processing module to determine the desired wireless channel by:

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selecting another channel within a group of channels of the plurality of channels based on a channel prioritization.

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38. The access point of claim 35, wherein the AP memory further comprises operational instructions that cause the AP processing module to interpret the channel spectrum information by:

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selecting the current wireless channel as the desired wireless channel when the current wireless channel has a least amount of interference in comparison to other wireless channels of the plurality of wireless channels.

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39. The access point of claim 35, wherein the AP memory further comprises operational instructions that cause the AP processing module to:

generate a basic service set pattern of neighboring access points within the wireless communication network based on the channel spectrum information.

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40. The access point of claim 35, wherein the AP memory further comprises operational instructions that cause the AP processing module to interpret the channel spectrum information by:

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determining that interference on the current wireless channel exceeds a first interference threshold;

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providing an increase power packet that indicates an increased transmit power level to at least one affiliated station;

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determining that the interference on the current wireless channel with the at least one affiliated station transmitting packets using the increased transmit power level still exceeds the first threshold, and

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when the interference on the current wireless channel with the at least one affiliated station transmitting packets using the increased transmit power level still exceeds the first threshold, generating, by the access point, the request packet.